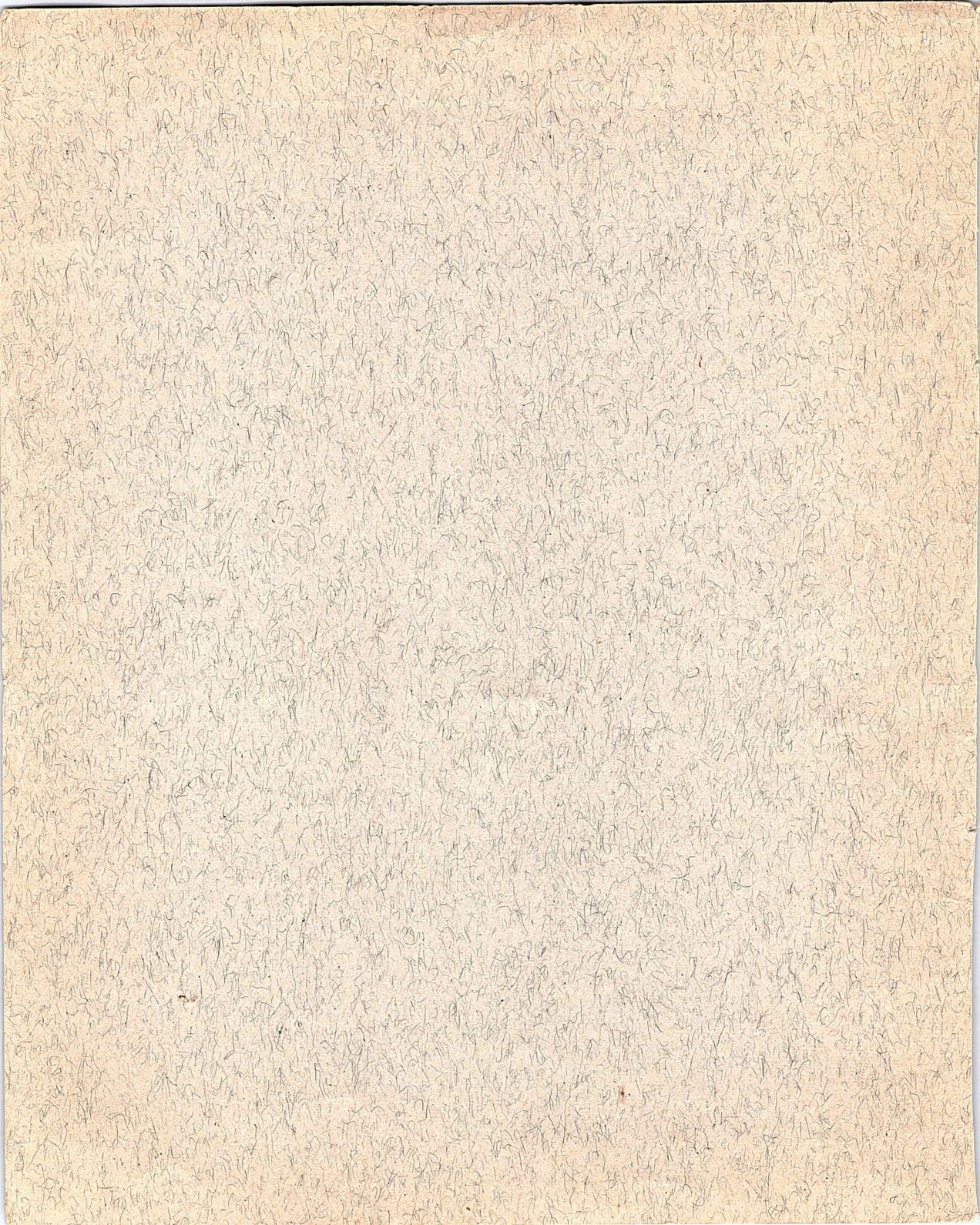


**EXHIBITION ISSUE**  
**August 1969**







JOURNAL OF THE CANTERBURY MINERAL AND LAPIDARY CLUB INC.

P.O. BOX 84, CHRISTCHURCH, NEW ZEALAND

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VOLUME 5 No. 2

AUGUST 1969

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VICE PRESIDENT - Mr. A. Evans  
VICE PRESIDENT - Mr. N. Ross  
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CLUB MONTHLY MEETING - SECOND THURSDAY EACH MONTH, FEB. TO NOV.  
IN THE RED CROSS HALL, CASHEL STREET AT 8 P.M.

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EDITORIAL

Getting out this Exhibition issue has proved to be somewhat of a challenge; in endeavouring to make this a really special magazine for sale to the public I have found myself up to my ears in members' contributions, photos, advertising-copy, etc., with a deadline looming ever closer. However, it is all very stimulating, not to mention exhausting, but I hope the finished article is judged worth the effort.

I would like to thank all members who kept a steady stream of material arriving in my letter-box, and also our advertisers, without whose help the cost of producing our Journal would be prohibitive.

But don't forget, the big effort for the Exhibition issue doesn't end there. Plenty of contributions will be needed for the next Journal due out at the end of November - early December, and also, if you have any sharp, contrasty, black-and-white photos of interest to readers, send them in. We have had quite favourable comment on our including photographs. Any other comments on the quality of this magazine will be welcomed -- do you want more technical articles? more lapidary? more geology? - is the style too folksy? too formal? Send in a few letters to the editor and let's have your opinions --- they are valuable.

See you at the Exhibition --- Ed.

PRESIDENT'S MESSAGE

It gives me great pleasure to address this message both to Club members and to patrons of our Australasian Exhibition.

The Annual General Meeting approved of a proposed plan, submitted by the present Committee, to extend the activities of the Club. Financial benefits have resulted from the monthly sales table, and interest and education has been extended by the showing of members' work and "finds".

Club rooms are a must! We anticipate leasing suitable premises in the near future and proposals will be submitted for members to approve. The spontaneous offering by Club members present at the June meeting to contribute a large sum in debentures is an indication of the desire of the majority of our members to obtain what was initially written in our Constitution -- the obtaining of Club rooms.

In accepting the nomination of President I resolved that this year of office must achieve three objects: namely - 1. a first-rate exhibition which would not only show the public what our members can achieve, but also the importance of minerals to Australasia; 2. Club rooms for the enjoyment and education of members in Club activities; 3. promotion of the Club to the benefit of members. The above, which were unanimously approved by members, are well on the way to fulfilment, thanks to an energetic Committee and members' support.

We welcome new members to a Club that offers enjoyment and fellowship to all members of the family.

The national interest has recently been reflected by the formation of a New Zealand Association of Mineral and Lapidary Clubs, subject to acceptance of membership by our August meeting. Our Club has been honoured with the duty of being the first "host" club for the Executive. Ken Allen performed a major task in helping to form a Constitution.

In conclusion may I thank, on behalf of the Committee, Mr. R.C. Sutton, Acting Australian Government Trade Commissioner, for his generous support to our Exhibition.

- Australian and New Zealand mineral exploration, development and manufacturing companies for displays.
- The Canterbury Museum, and the Geology Department of the University of Canterbury.
- The Society of Arts.
- Commercial interests and advertising channels.
- All Club members and others whose assistance in presenting our Exhibition will be appreciated by all who attend.

Bill Richardson.



NEWS FLASH !!

ASSOCIATION

The big news at the moment is that at the meeting held in Hamilton on August 2nd and 3rd of delegates from all over the country, a constitution for association was unanimously approved. Delegates with full mandate from seven clubs committed their clubs to it and now all that is needed for the Association to be an accomplished fact is the approval of the Registrar of Incorporated Societies.

Your club played a prominent part in drawing up this Constitution and as your delegate I am well satisfied with it as modified by this meeting. It preserves autonomy, both for your club and for others, but provides the framework on which we may co-operate to great mutual advantage. Please note that it is a constitution for association, not federation. When the full report of the meeting is forwarded to us with a copy of the approved constitution I am sure you will be very happy with it and see in it the possibilities for widening our fields of interest very greatly.

Your committee has voted unanimously that we join the Association and will be asking for the support of the next general meeting on this point, so that by the time you read this your club is likely to be a full member. Further, the meeting in Waikato has done your club the honour of appointing it the host club for the first term of the Association's operation. This means that the President, Vice-President and Secretary-Treasurer will come from the Canterbury Club during this first term. In the meantime your committee has appointed me as Interim President, with Alan Brown as Vice President and Judy McCarten as Secretary-Treasurer. We will go into action as soon as we get word from Waikato, subject, of course, to the approval of those at the next general meeting (August 14th). We will be circularising all members about this.

At Hamilton the delegates from all clubs worked very hard and obviously spared no effort in the interests of their clubs. We did not agree all the time but we reached agreement, and relations were very cordial. Before closing this brief news-item, for that is all it can be at this stage, I would like to record my appreciation of the tremendous job done by the Waikato Geological Society and especially by its Steering Committee, for the benefit of us all. Not only did they spend many hours in research and compilation but their handling of the meeting was superb. Their fairness and quiet objectivity made what could have been a difficult meeting a model of its kind. Ken Sandford was Chairman, Berri Caldwell was Secretary for the meeting, and Tom Nicholls, Secretary for the Steering Committee, served in the very valuable role of chief expositor, if I may use such a term. Without these men and their assistants the Association could not have got off the ground. I am sure you join me in thanking them.

Ken Allen.  
Delegate.



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ROCKING AROUND THE CLOCK (Global, that is!)

"One o'clock, two o'clock, three o'clock rock,  
We're gonna rock around the world till night -  
Rock, rock, rock, in the broad daylight! --- etc. etc.  
(with apologies to Bill Haley & his Comets)

Hey, what's this supposed to be, a jive session or a travel talk  
--- let's cut the cackle and get cracking!

I left Auckland early February a couple of years ago, having travelled by Landliner past steaming Ngauruhoe - a marathon journey that one and no error - not lightly to be repeated except in small stages. Across the mill-pond, (alias the Turbulent Tasman) to Sydney where the whole of the first (and only) sunny day was spent - guess where? Museums, where but, looking at rocks. The Sydney museum mineral dept. has a most interesting entrance in the form of a limestone cave complete with stalagmites and stalactites. Inside is just as good. Particularly the opal collection bequeathed, presumably, by some prospector - huge boulders of the most gorgeous colours. A veritable fortune, and no error. In my efforts to find the museum almost under the approaches to the bridge, which, incidentally nobody in Sydney outside of museums appears to have heard of, (you can say that again -- Ed.) I got to another museum, I think, of technology up near the Railway Station. Quite interesting, but there I found where to go for what I wanted, namely, the Mining Museum which had about as good a display as in the main Sydney museum. Would I have liked to have got my hands on some of those specimens.

Then on from Sydney, up inside the Great Barrier Reef along the Queensland Coast, past lush tropical islands. Around the top of Australia past New Guinea and the Indonesian islands, all seemingly volcanic cones, very picturesque. Then on to Manila in the Philippines, amazement at the size of the bay. Out in the country about 50 miles to a romantically picturesque spot, ringed by volcanic peaks, very lush and green, with a very blue lake. A few months previously a subterranean volcano in this lake had erupted and killed hundreds, but such is tropical growth that no traces were visible. The rest house, hotel or whatever, was very modern and furnished in shell tables, pictures, etc., and one wall of the restaurant was composed of multi-coloured volcanic rocks, probably rhyolite.

On to Hong Kong, and how steep and barren are its hillslopes. To prevent undue erosion in heavy rain, the hill channels have weirs, presumably to prevent too rapid a run-off. Hong Kong, Singapore and Bombay were spent either in looking at droves of Buddhas carved in everything from jade, lapis lazuli, rose quartz, carnelian and amethyst, or acquiring carved specimens, (but no Buddhas, thanks). I might add that although things seemed very cheap it was nothing short of amazing the way the money vanished. On to Aden in all the riots, and



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fears of bombs being planted in the ship, and up to Suez where we disembarked to go to Cairo. What fascinated me most there was the Archaeological museum and to see King Tutankhamen's treasures from the tomb. The fact that they contain \$4 m. worth of gold didn't impress me, except to spend (pretty hard up at this stage), as much as the exquisite workmanship in the jewellery etc. When one realises this was all done about  $3\frac{1}{2}$  thousand years ago, with presumably primitive tools, it is indeed an object of wonder. Even the fact that slaves abounded, and time and life counted for very little, doesn't detract from the wonderful workmanship. I could have stayed there for days!

Out to the pyramids - one of the seven wonders of the ancient world - quite frankly a disappointment to me, due chiefly to the fact that with the suburbs of Cairo almost to the foot, their thunder was stolen and their impressiveness whittled away by housing estates. What was I doing, nose to the ground, collecting rocks, all heavily impregnated with camel, instead of gazing in awed wonder at the marvels towering above me. What did impress me more than the pyramids were the huge granite blocks in the temple near the Sphinx, about 15 ft. by 5 ft. all perfectly hewn; couldn't have been straighter with a modern saw. The Alabaster mosque up near the citadel was a marvel of beauty and workmanship too, but of course very modern, a mere sixty years or so old.

On to Naples in a gale so that the proposed trip to Vesuvius was "off". One could see the clouds of grit being blown from miles distant. Instead we saw the ruins of Pompeii via the cameo factory where we saw the cameos being carved from shells, and of course sold in the shop. Pompeii was quite extensive and well preserved. What interested me most were the artistic treasures which had been removed to the Naples museum. The mosaics, (probably Greek) were so fine as to appear more like tapestry than stone. And some of the sculpture, evidently carved from alabaster-type rock were fabulous, one having actually to touch the draperies to reassure oneself that they were not in fact diaphanous silks. In Cairo I acquired a tiny head and shoulders of Queen Nefertiti in alabaster with "built in" tiara of more solid stone which really looks the part. Past Gibraltar on to Lisbon, most of which had been destroyed in a disastrous earthquake some two hundred years previously and which has been re-built with many of the buildings tiled in blues, etc. up to first floor level (presumably a legacy from Moorish occupation centuries ago). The use of painted or coloured stones set in geometrical designs for pavements in principal streets were NOT designed for hobbling over in high heels. Portugal seemed a pleasant place and its vegetation, like that of Naples, geraniums, etc., reminded me of Cashmere and Sumner. Then off on the last leg across that mill pond sometimes misnamed Stormy, the Bay of Biscay, to Tilbury. And so the devoted follower of fashion (rocks, that is) sets out to leave no stone unturned in Swingin' London.



First port of call in London; a bee-line to the British Museum to see the Elgin marbles, removed from the Parthenon in Athens. I was horrified to see the extent of deterioration which had taken place, and had they not been protected for the past hundred years little could have remained at all. The British Museum is chiefly famous for archaeological pursuits, and near the Elgin marbles are excavations by Sir Leonard Walley and others, from the cities of Nineveh, Ur of the Chaldees and other places. Many of these were bas-relief panels depicting military actions, or the spoils of victory - treasure, headless foes, etc. The Egyptian section upstairs seemed to me to contain more sarcophagi etc. than in Cairo, and downstairs more than enough bulls, sphinxes and statues. But to me the best of the lot was the Rosetta Stone, a slab of basalt about 3 ft. long by about 18 ins. wide, containing the key to the hieroglyphics, being written in three scripts, hieroglyphics, ancient Egyptian and Greek. A find if ever there was one, and found by a good keen French officer who was more than a little irate at being relieved of it as a result of the Battle of the Nile during the Egyptian campaign in Nelson's and Napoleon's days. And so, instead of gracing the Louvre in Paris, it remains in London. Whenever there was a "dead-loss" day weather-wise in London, back I would go to the museums.

As feet and brains will only stay the course for about an hour this is very necessary. I was very interested in seeing the development of jewellery through the centuries and after seeing the exquisite workmanship of, say, King Tut's treasures came to the conclusion that the Dark Ages really were dark.

What amazed me particularly was the early glass; Roman roads, Roman law, Roman legions, etc., yes, but Roman glass -- I'd never heard of it. And long before Roman times, too. The earliest glass in the British Museum is made of coils on a sand cone base, and very beautiful and intricate it is too, including shapes such as fish. But Roman glass with its iridescent sheen -- incredible that I had never even heard of it. One of my prize finds and indeed, chief joy, was to go to the new Edward VII part of the museum where was displayed, among other things, the treasure from the burned Viking ship from Sutton Hoo, and gaze in absolute amazement at the Lycurgus Cup. It is carved with mythological legend in a dirty, pale olive green glass, but when one looks through the glass the colour changes to glorious ruby red, yet the inside is still the dull green. Unbelievable! And in the exterior decoration some of the parts, such as branches, are completely free standing. In a recent exhibition of glass through the centuries held at the British Museum this cup was on a revolving stand; the top billing that it indeed merited. Alongside was a modern attempt at making a "cut cup" with modern electric tools and in a geometric pattern, very, very simple by comparison with this one, even so, it took a skilled craftsman a year. Another piece of glass which I used to admire -- also on a pedestal, as well it should be, was the famed Portland Vase. Another Roman triumph - how did they do it? Somebody please tell me! The vase consists of two layers of glass, dark blue



underneath, white above, which is cut out in cameos representing some Greek myth. Just have a try at chipping glass! Of course, there was much, much more, not forgetting the library housing the most precious illuminated vellum manuscripts, etc. The only thing to do was keep on returning always to say "Howdy" to the favourite things, and then trying to assimilate more of the unknown. As I said, the capacities of my feet and brain are both exhausted in about an hour.

The British Museum is only one of the many interesting to be found in London, usually each specializing in some aspect. The Victoria and Albert, (commonly known as the V. & A.) is supposed to contain seven miles of passages all devoted to objects d'art. Try that on your feet and brain! Little and often, as with the other two great loves, the Geological and Natural History -- but that's another story.

Anne de Bueger.

(We'd love to hear it some time ---- Ed.)

\* \* \* \* \*

Dear members,

Have you, like myself, wondered what to do with all those cast off specimens, making such a clutter around your garden or back door? Well, here is my solution to the problem:

There are agates galore  
Around my back-door,  
I confess all are sorted for ditching.  
But I do not laugh  
When folk walk up my path,  
Their eyes popping out, fingers itching.

"All are yours" I declare  
With a generous air,  
"All are yours for the effort of bagging".  
Then I have a quiet laugh  
As they trot down the path,  
Back door tidy, retreaters not lagging!

Marjorie Warren.

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BOOK REVIEWS

Geology for the Young Naturalist. Allen White.

This is a relatively short book, very easy to read, and most suitable for beginners. It contains sections on rocks, minerals, fossils, petroleum, crystals and the ice-age. It is well illustrated with black and white photographs and numerous line drawings, diagrams and illustrations.

A Field Guide to Rocks and Minerals. Frederick H. Pough.

As its name suggests, this is essentially a book to take with you in the field, and is tops for this work. It is one of the most compact and best illustrated books in the series. It contains large numbers of black and white photos, very many coloured photos and numerous crystal diagrams. There is a good index and a glossary. It is a must for all rockhounds.

The Face of the Earth. Prof. G. Drury. Paperback.

This is a book for the general reader. It combines both geology and geomorphology, but biased towards the latter. It contains eighty-two photographs and numerous diagrams. This edition will give the reader a sound background account of the general surface features of the earth.

Australian Rocks, Minerals and Gemstones. R.O. Chalmers.

This book is both for the general reader and the scholar. It contains the chemical formulae and other details for the specialist in the field. There are eight coloured plates viewing forty-eight specimens in true beauty. Its 398 pages are packed with information. It has both an index of localities and a subject index. Tourists to Australia would do well to take this book as a guide.

Allister Evans, Librarian.

\* \* \* \* \*

*It is with regret that we record the death of  
Hileen Diver.  
The clubs sincerest sympathy goes out to Jim.*



BLACKBALL

Another dying coal town, the "Star" said.

Ever since we bought the old Dominion Hotel last year we have had ample opportunity to really study this town and the surroundings. Queen's Birthday week-end we even got to the Franz Joseph Glacier comfortably. After a cracking frost we left at 10.40 and after two half-hour stops we were at the dead Ice at 2.20.

Last Easter 83 Club Members went to Blackball to our Lodge. Many of the houses have been bought for holiday homes, the access roads have been upgraded, bridges are being re-built, and the Tender has been let for another footbridge across the Grey River giving access to Ngahere and Stillwater.

The Geological History of this area is interesting. Blackball is situated on glacial outwash gravels, the quartz sandstones, grit, and conglomerates with coal seams are just west of the town. Well-bedded, shallow-water blue-grey siltstone and sandstone outcrop up the Moonlight stream, and Croesus Knob is of dark grey well indurated greywacke, some of the oldest rock in the country. There is a good track up there, and a guide can be arranged.

The Paparoa Range has a basement of granite and gneiss of Precambrian age. The Geological Map of New Zealand, Sheet 15, tells us that the Paparoa group is upper Cretaceous. This group occupies the much faulted Anticlinorium at the south end of the Paparoa Range, with northern outliers on the west side of the range. It comprises the following formations: Jay Coal measures, 0 to 1,500 feet, with basal breccia, Ford Siltstone, 0 to 500 feet, Morgan Coal measures and volcanics, 150 to 1,500 feet, Waiomo Mudstone, 80 to 300 feet, Rewanui Coal measures, 0 to 1,100 feet, Goldlight Mudstone, 0 to 600 feet, and Dunollie Coal measures, 0 to 100 feet. Deposition of the Paparoa Group was followed by peneplanation before renewed tectonic activity led to Eocene sedimentation.

Granites in the creeks sometimes show phenocrysts of pink orthoclase; pink garnets may also be seen sometimes. Quartz pebbles of many colours may be collected off most of the West Coast beaches, Jade has been found by the writer at Hokitika River mouth, Serpentine Creek, Taramakau River, Blaketown Beach, Rapahoe Beach and at Puna-kaiki. Gold may be panned in many places.

Anne Niethe.

\* \* \* \* \*

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HELLO.....Perhaps your show is going to give us the opportunity to come down to the main land, and see some of your lovely specimens, we have heard so much about the agates and numerous rocks that we are keenly hoping to see some in August.

Of course we will also be looking forward to meeting as many of you as possible so see you at the show.

See our 10" Gem Maker at work; we will be demonstrating at the show the full use of this versatile machine; a complete hobbyist machine at a reasonable price.

Regards M. & K. Boese



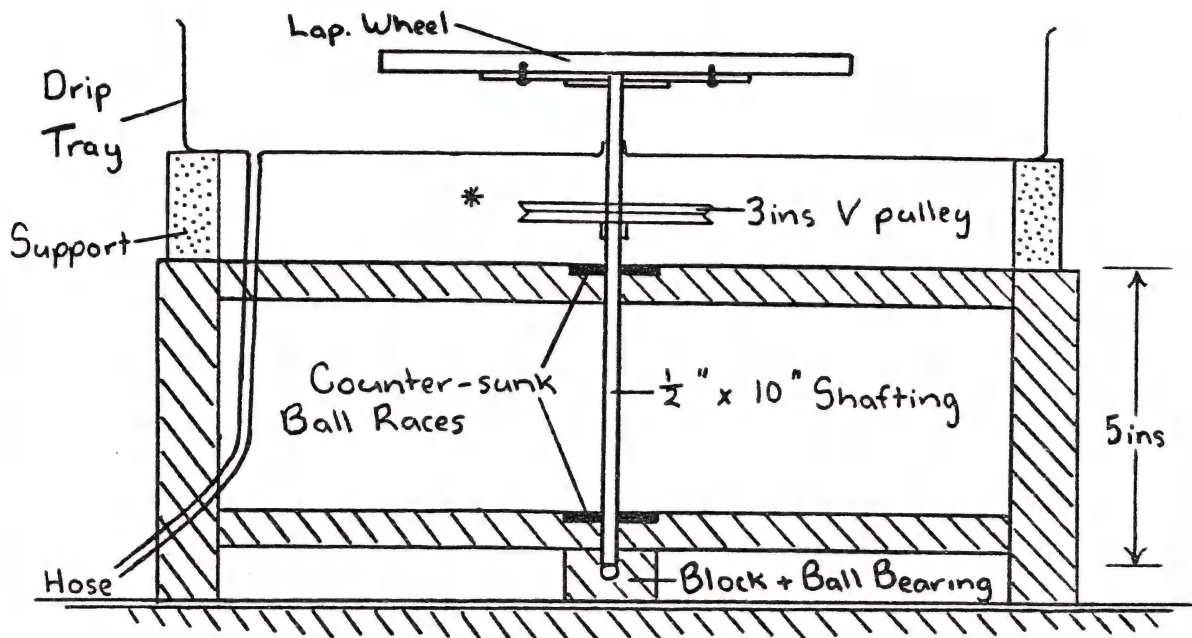
### A LAPPING WHEEL EXTENSION FROM YOUR TUMBLER

We have a tumbler made from John Campbell's instructions mounted on a bench in the shed (see C.M. & L. Club Inc. Magazine, Vol.3, No.1, June 1967). Our tumbler rotates at 37 r.p.m. and we have found that this speed is suitable for polishing as well as grinding, so we were left with the polishing end vacant. Wanting a lapping wheel we decided to convert the idle polishing portion.

The tumbler assembly is nailed to two lengths of 5" x 3" timber to give clearance for the 10" pulley, which for safety, was put on the far side of the bench. The distance between the 5" x 3" supports is 10½" allowing room for a gallon point tin, so we cut two 3" x 2" x 10½" pieces of timber to support the ½" diameter shafting 10" in length which holds the lap wheel. This should be well braced between the lengths of 5" x 3" which holds the tumbler. The used ball races - obtainable from an automotive electrical engineer - are counter-sunk in the centre of the supports which holds the shaft. If your ball races are too big put a few turns of sticky tape around them till they grip. The shaft turns on a ball bearing placed in a hollowed out block of hard wood - well oiled. The top of the shaft must be turned to take a nut of suitable size. The nut is welded on to the centre of an iron strip 4" x 1½" x ¼" - you need two of these with a hole bored on either side of the nut, this is screwed to the lap wheel. The lap wheel consists of an old eight inch stove element - easily obtainable from an electrician's shop - with the porcelain and wires removed and replaced with a disc of 5 ply. The polishing wheel is made of another 8" dia. disc of 5 ply using the other iron strip with a welded nut. To complete, cover with Feltex or carpet. Now to get things moving; fit a 2" pulley on the rear shaft which supports the 10" pulley of the tumbler. A 39" A section belt passes round the 2" pulley and around a 3" pulley, with a quarter twist on the lap wheel shaft. This should give approx. 175 r.p.m., rather fast but quicker grinding. The 3" pulley is fitted just below the drip tray, the latter in our case, being an old roasting dish 15" x 12" with an opening cut into the centre which the shaft passes through. The drip tray rests on a block of wood so that the sides of the drip tray come well up round the lap wheel for the grits and water tend to spray outwards. The area around the centre of the drip tray should be beaten up so that the water and grit will not go down the shafting and so ruin the ball races. A drain can be made in one corner using plastic hose, with a bucket underneath to catch surplus water and grit. It is advisable to have two shafts to which the 10" pulley is fitted as the rubber hosing on the tumbler shafting would have to be replaced each time you wanted to use the tumbler.

There is an excellent article on using a lapping plate by Dot Ross in our magazine Vol.3, No.3, December 1967.

Nora Fahey.



\* 3ins Lap. Pulley to 2ins tumbler pulley.

Here is a comment taken from the "Rockhounder" and "Opal" newsletters, U.S.A.

"At the last meeting it was noted that people again were handling the specimens --- This is a distinct violation of all good ethics and practices concerning other people's property.

Unless a mineral specimen, lapidary example or fossil is actually handed to you by its owner, DON'T pick it up or touch it.

No amount of money or apologies can replace a ruined specimen, so PLEASE keep your hands off, and if you see someone else handling or about to handle one of the specimens, tell them to keep their hands off also.

NOTE: I am sure that many of us in a moment of enthusiasm has violated the above rules of etiquette; so just remember, unless the owner actually hands you a specimen, DON'T PICK IT UP OR TOUCH IT!!"

'nuff sed -- Ed.

\* \* \* \* \*



THE WAIPARA GORGE TRIP

ORDEAL BY WATER

Although a rockhound of some years' standing - or stooping - my collecting has been mainly confined to a leisurely stroll along a beach or a hurried search near a river while the family stops for tea en route to somewhere less interesting.

The Waipara Gorge trip was my baptism (almost literally) into the more serious aspect of the game. I learnt a lot. Naseby was luxury with its door to diggings transport and Blackball hardly more strenuous, apart from the social side that is.

We left Christchurch on a cold and frosty morn at an hour when sane folk are still between warm sheets. Once in the bus I was presented with a beautiful pair of boots by a Good Fairy. I promptly filled them, tucking my own less suitable footwear out of sight and showed my gratitude by letting her use one of my boiled eggs, still hot from the pot, as a handwarmer. All that humanity soon warmed up the bus and we were wiping windows, the better to see what Ken was talking about. I have travelled the North road countless times and wondered about those ridges to our left, now I know that they were once beaches.

About here Ken began to explain to us the Wegener theory of Continental Drift and I remembered the fact that the half m.m. movement a year is not consistent but could build until pressure was sufficient to produce a tremendous earthquake. This bit of information I used later to try to scare the daylight out of the family - no reaction - I added that the Grey fault probably runs clean through our section, the garden has had little attention since.

During the tea break at McCoy's Bridge I was asked by Anne (who always takes the correct equipment) if I had spare socks. I replied proudly that I had, not mentioning that aforementioned G.F. who knows well my propensity for disremembering important things, had filched a pair from her son's drawer for me.

I should have realised as we moved crabwise down a steep slope to the river, what lay ahead. I remembered someone saying we would have to cross the river 'a couple of times' ... I must have missed 'dozen'. I had visualised this as picking my way daintily across on convenient stepping stones. I was sadly disillusioned, the water was lapping around my chilblains at my second step. Once across I promptly sat down to take off my boots but was stopped by G.F. who said the water would keep my feet warm. I quickly lifted my feet to let the water out of the backs of my boots; it ran straight up my legs. All that stuff about keeping my feet warm was merely an effort to keep me from slowing down the party. G.F., an old trouser, knew only too well that if one stops to do up as much as a zip, Ken, whose boots are of the

Seven League type would be inaudible and a mere speck in the distance, his pearls of knowledge lost to us for ever. I caught on quickly, a few more dunkings, a quick nip under some wire, and the equivalent of a four minute mile and I caught up with the commentary when Ken slowed down to a gallop.

I was fascinated by those huge concretions in their different stages, these things give me an uncanny feeling and had I been alone my imagination would have conjured up the Saurians who have so conveniently left their bones behind. We moved on to one of the most interesting areas with slices of the past laid open like a cut through a huge club sandwich. I found here what the voice of experience told me could be a fossilised bone. I am not showing it to the experts to have my hopes dashed, but display it to those more ignorant than myself ... and there are some ... I tell them it is a fossil of the Upper Cretaceous period. I say this firmly, looking them straight in the eye, defying them to question this! I found this place most impressive and left it reluctantly, making a mental note to tell the family of that huge fault showing here with casual reference to our twenty-eight inch foundations.

We retraced our wet steps ... sorry to harp on these crossings, they are all right for great tall folk of five feet two and upwards, they cross like storks while normal sized people like me get moist to the edges of their w/b's. The brisk air and exercise had sharpened our appetites and back at the bridge we gannetted in peaceful surroundings and warm sunshine. I couldn't find my eggs and thought dark thoughts as I watched G.F. devouring one but looked at my nice boots and said nothing.

Afternoon saw us off in a different direction up, down, over, under and through. I was awestruck at all that Bentonite, I pay twenty-five cents an ounce for this. I nibbled a bit and grabbed a large hunk which I shall try out to 'polish' my wines before bottling them. If they turn out a little earthy I shall reserve them for Blackball; what rockhound would notice after a day of rock licking! We eventually reached that fantastic gorge where shutterbugs and crystal types got busy while the lazier ones rested.

#### THE GREEN EYE OF THE LITTLE YELLOW GEODE

About turn and the mixture as before only in reverse. G.F. made me keep up with Ken (I suspected from the first that her motives included more than a thirst for knowledge). She has a parka with a capacious pouch, which I suspect reaches her knees. Her heart is as big as all outdoors and she offered - repeat - offered to carry for me some quite large lumps of the past. Ken gave her a small geode from his pocket, this is why she stalks him ... a quick gloat and it went into her pouch. This extra half ounce, like the straw that broke the camel's back proved to be her downfall - literally. Gravity being what it is, all that ballast for'ard on a steep incline was bound to



have its effect. If she had let me carry that geode it may never have happened, before the tremor was even recorded on the Coast she muttered an oath and assumed as near upright a position as is possible for a Front End Loader on a gradient of one in two. I made suitable noises and refrained from voicing my fears that my rocks may have been fractured. We slowed our pace and cut out the chit-chat. Mary, used to Ken's pace, was already at the top, gazing like Bo-Peep at her sheep spread out below.

We smelt smoke (where there's smoke there's tea) and we bleated our way up the last few feet to collapse in moist heaps.

G.F. proceeded to unpack her pouch, quite something to behold and reminiscent of youthful days and stockings hung with care, as her hand delved deep into its mysterious depths to bring out treasures.

After inspection (envious) of other people's specimens I decided to put on my dry footwear and discovered (a) my two pairs of socks were both on me, very wet and (b) my long lost eggs mangled and unappetising had been in my dry shoes. (Silent apologies.)

We set off again for civilisation with an all too brief stop to check our fluid intake/output balance and then back again to the world of normal people, all richer in knowledge and/or specimens, tired, grubby but happy and looking forward to the next trip.

Betty Reece.

P.S. I saw that geode later, beautifully polished and set. What an inspiration to have it made into an article of adornment; I suppose it was inspiration and not determination to keep it from son's collection; he too has the maggie instinct. Do I sound jealous? Not a bit of it, if I had known G.F. was going to have it set in gold I would have offered her all the gold I found at Naseby and Baxter's Creek - both flakes. I looked at my own haul to see what I could wear but that iron concretion would bow me low, and my bone ... well, I don't propose to look like a New Guinea native! G.F. has, with her usual generosity, arranged that her treasure shall repose where everyone can see it but herself. Long may she wear it in good health.

B.R.

To prevent an overloaded tumbler motor from overheating and burning out, run a small fan beside the motor. These small fans use very little electricity so the extra cost is negligible.

Before cutting extra special stones of which you have a very limited supply, make several models of the complete stone with plasticine and cut these models in various ways until you are satisfied with the final shape, then cut your stone. This can save a lot of waste as even the off-cuts can be useful shapes.

Murray Granger.

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FUCOIDS

Selwyn Fantham told me of the large scallop shells he had found in the limestone just north of the Middle Waipara Gorge, and the way he had his arms spread I didn't think Pecten grew so large, but after wading the river once more, here they were, large flattish fluted radiating things, obviously not a shell. Only once before had I seen these interesting fossils. In the Gower River with the W.E.A. Field Club, led by Mr. R. Mead, who showed us these things.

Here is a note on fucoids by Dr. G.R. Stevens, Palaeontologist at the Dept. of Scientific and Industrial Research, Lower Hutt.

Anne Niethe.

"Fucoids", or to give them their scientific name, *Zoophycos*, often take the form of flattish conical impressions with radiate flutings. At first sight they look like giant scallop or mussel shells. Although we can say for certain that they are not shells they are nonetheless enigmatic fossils and there has been many an argument about their origin. Some palaeontologists have thought of them as being the impressions of seaweed-like plants; others as whirlpool structures, formed where currents and rips of past oceans have left their impressions on the sea floor. But modern interpretations have swung towards recognizing them as markings left by marine worms. They are thought to be either the feeding patterns or the gill organs of the worms.

Deep sea photography has shown that very large marine worms are quite abundant on the sea floor, even in very deep water. These large worms burrow their way through the soft muds on the sea floor, eating the mud, filtering out the animal and plant life in it, and pushing it out to form distinctive patterns, that are preserved in the sediment.

The worms have large feather-like gills that project from the worms burrows and it is known that they can be shed at times when currents, for example, sweep across the sea floor. These shed gills may then be carried away and deposited in quieter waters, where they become incorporated in the fine sediments accumulating on the sea floor.

In New Zealand, fucoids occur in fine-grained rocks that probably accumulated in very deep water - fine sandstones, siltstones, mudstones and marls - and are generally the only large fossils present. Specimens are known from the Amuri and Amberley Limestones of North Canterbury and South Marlborough, the Mungaroa Limestone of the Wairarapa and marls of inland Taranaki province.

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NEWS FROM 'OUR MAN' IN CALIFORNIA

While writing this I am seated on a rickety old chair in City Park, Nyssa, Oregon, which is close to Idaho Line, about 700 miles from home. I have a rather shakey table on the grass under the shade of a tree.

In the sun the temperature is 102° and that is HOT!

I drove all the way via desert country - almost as hot driving steadily two days to get here!

There is a big 'rock swap' and show session here and it has drawn so far over 100 different caravans, campers, (trucks converted for sleeping), tents etc. from all over the Western U.S.A. and some from Vancouver, British Columbia.

Here there is swapping, selling, entertainment etc. and cars are parked all around the edge of this big park. The hot sun hits our car for hours and makes it impossible to enter it.

Since I started this two hours or more ago I have had a dozen callers wanting to swap, or just talk.

Field trips are conducted every day but many people are discouraged by the intense heat.

We expect to leave here in a couple of days and stop en route at the Obsidian Beds where I hope to load a couple of hundred lbs to bring home.

As I think back about the wonderful experience I enjoyed in Christchurch I can hardly believe it happened and it seems more like a lovely dream, and then I think how privileged I was to receive all those honors bestowed on me - a wee old man!

Please tell your Club I send my love to everyone.

Fred Bentley.



GEOLOGICAL TOUR OF SOUTH AUSTRALIA - PART 3

ANDAMOOKA OPAL FIELDS

This trip promised to be a very exciting and interesting finish to the tour. Just how exciting, we were yet to find out. We set off for Andamooka on a bright sunny day full of hope that at last we were going to enjoy some of that good hot Australian desert weather. Hot days and cold nights we had been told.

We travelled once more to the south end of the Flinders Ranges via Hawker to Port Augusta where we stopped for lunch. From here we turned north and drove up on the western side of Lake Torrens. Andamooka is rather further north on the western side of the lake than Angorichina is on the east, so we had a long day ahead. Soon after leaving Port Augusta we were once more in the wide open spaces - flat farm land at first but later turning into semi-desert. I suppose there were sheep and cattle on it but we didn't see any - only the occasional kangaroo.

We followed a pipe-line taking water to the outback towns for miles and miles, and beyond this in the far distance were the remains of uplifted mountain ranges that had been eroded until all that was left were a few mesas or "tent-hills" so named because of their shape, and an occasional butte rising above the horizon which appeared to be far, far away. This made us realise the immense areas of flat desert lands in Australia.

These plains have been formed by erosion from the once existing mountain range as well as by sediments laid down when the sea invaded this part of the country. The sedimentary layers are very rich in a variety of minerals. The surface of the land we were passing through was covered with a layer of "gibber" pebbles worn and washed down from the mesas.

We came to a very small township called Pimba where we changed direction slightly to drive round the outskirts of Woomera. This gave us a real thrill even though all we could see of it were the locked and guarded gates, and inside a high wire fence the outlines of buildings in the distance. We were not allowed into Woomera, of course, so had to content ourselves with a distant photograph or two.

The road deteriorated from this point on to become just an ill-defined desert track which was not easy for our driver to follow, especially as he had been warned to watch out for unmarked detours so as to avoid stretches of swampy mud (the result of those recent rains). It was difficult to decide which was the track and which the detour. Our driver had no wish to get us all marooned so the going was slow and cautious and oh! so bumpy!

Night closed in pretty fast and it seemed as if we would never

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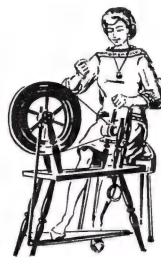
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**\*\*CARVE HEADS**

**\*\*FIGURES**

**\*\*PAPER-WEIGHTS**

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arrive at our journey's end, when in the middle of nowhere we saw a gleam of light. Hopes that we had arrived rose as we came nearer and then the glow turned out to be a bonfire at the side of the track with real human beings tending it, - and what was more, they had a billy over the fire. They hailed us and said, "How about a mug of billy tea mates?"

And did it taste good!

These stalwart Aussies had come to meet us and guide us on over the rest of the 37 or more miles of our journey to Andamooka. But - they didn't turn out to be very good guides. Their car got through the biggest bog yet, but not our bus. Oh no! We stuck in the middle. And it was dark - and cold - and it was a case of all out, roll up slacks, take off boots and socks and push! - in mud well over our ankles.

When we finally got the bus moving again it suddenly took off and left some of us at the rear end rolling in the mud - red mud at that!

We set off again, tired and filthy and hungry and at last arrived at a large tin hut, our new abode, to find they were short of water in Andamooka and we could have just a half basinful each to wash off all that mud!

However, there was a good hot meal waiting for us and we were soon in good spirits again.

After a short lecture on the type of country, the minerals to be found here, methods of mining and an outline of the arrangements that had been made for us, came that fight with the sheet bag and the bed roll. It's one thing to insert oneself into a straitjacket on a proper firm bedstead but just try it balanced on a camp bed that tips up when you are halfway in and with twenty or so other women doing the same, and I guess you'll have plenty of entertainment. We were told that as we were New Zealanders we were favoured by being given camp stretchers. Aussies who use this tin hut hostel have to doss down on the cold hard concrete floor.

We settled down eventually only to become colder and colder as the night wore on. What's more, we had a virulent flu bug travelling round with us and these cold nights were just what it thrived on. Some of us coughed most of the night and the rest of us just listened and kept on shivering.

The next two nights we wore two sets of everything underneath and put on thick socks, tights, slacks and a couple of sweaters, and layers of newspapers under our bed rolls. Then some very kind friends we met on our arrival lent us some really warm sleeping bags and blankets. This made a wonderful difference and we were most grateful. Even in spite of this one of our number had to be taken to the very

up-to-date centrally-heated local hospital with the threat of pneumonia.

It certainly was a most unexpected cold spell. The days were much more enjoyable though, as we were kept busy enough to keep warm. We were allowed to fossick around the mullock heaps around the mines and had a wonderful time picking up discarded chips of opal, gypsum crystals and lots of other bits and pieces. We were taken down an opal mine and saw the cramped conditions under which the miners work. We also went out to the Andamooka airfield where we found specimens of chert and opaque agate. The airfield, by the way, was just one wide lake so the only way in and out of Andamooka was by car.

One of the miners brought a selection of opal cabochons to the hostel one night and sold them to us much more cheaply than we could have bought them in the cities.

Something else we collected too - insect bites, which swelled up quite frighteningly on some of us. One girl had to be treated at the hospital as her hands swelled up like boxing gloves. That hospital certainly was a godsend.

Our last day at Andamooka was bitterly cold with threatening skies and a bitter wind. We were told that if rain set in we would probably be marooned there for a fortnight as the track would be awash. We had a barbecue meal outside the hostel that night and ate it in the welcome glow from the fire. Some of the men found an old oil drum and later brought some of the fire inside the hut setting the drum up on bricks, etc. It got pretty smoky but we didn't mind that. After all Esquimaux have survived their smoky chimneyless huts for centuries, and we were able to get into our sleeping bags feeling much warmer as long as we did it quickly.

We were awakened in the very early hours by a heavy shower of rain on that tin roof above us and there was an immediate agonised cry of "Oh no!" from all around. Luckily for us the rain stopped almost as soon as it had begun but we were not risking further showers so everyone was up and packed and breakfasted very early.

We packed our bedrolls, returned our borrowed blankets etc., tidied the hut and after thanking the splendid University Students who had come to cook our meals and generally look after us, we were on our way. We lost no time in geology side trips until we were well out of the desert when we were taken to Iron Knob, a mountain of iron ore which is being quarried in a big way. Then on our way again to Whyalla where we were spending the night.

And oh joy! We pulled up outside a very modern block of motels, the "Copper House", centrally heated, as clean as a new pin and with plenty of hot showers and real beds! It was the nearest thing to heaven!





Zoophycos specimen from Southern Taranaki, obtained from rocks about 7 million years old.

The specimen measures 10½" by 14½".

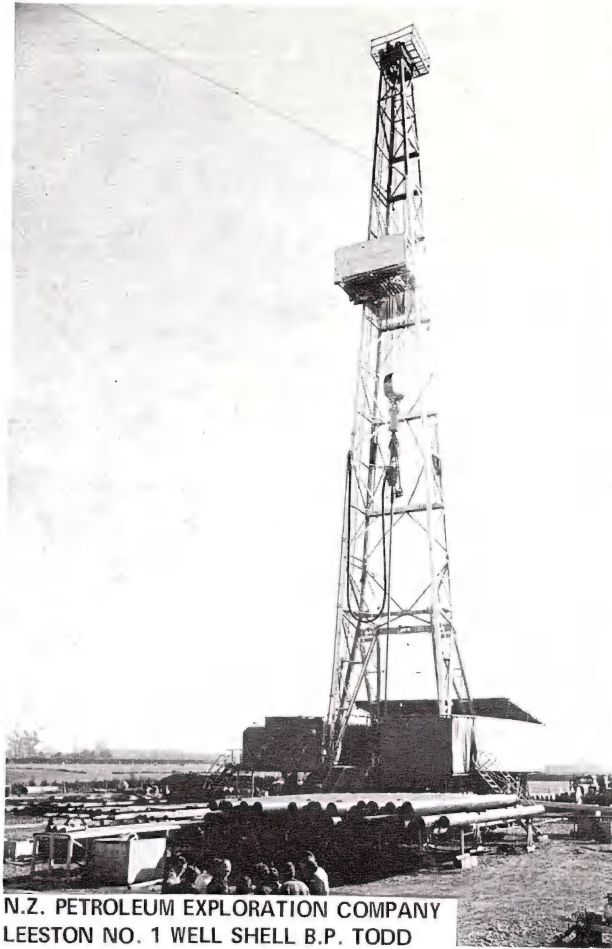
N.Z. Geological Survey photograph.





MIDDLE WAI PARA GORGE FIELD TRIP

GORDON TUBBS SUCTION DREDGE HOGBURN, NASEBY



N.Z. PETROLEUM EXPLORATION COMPANY  
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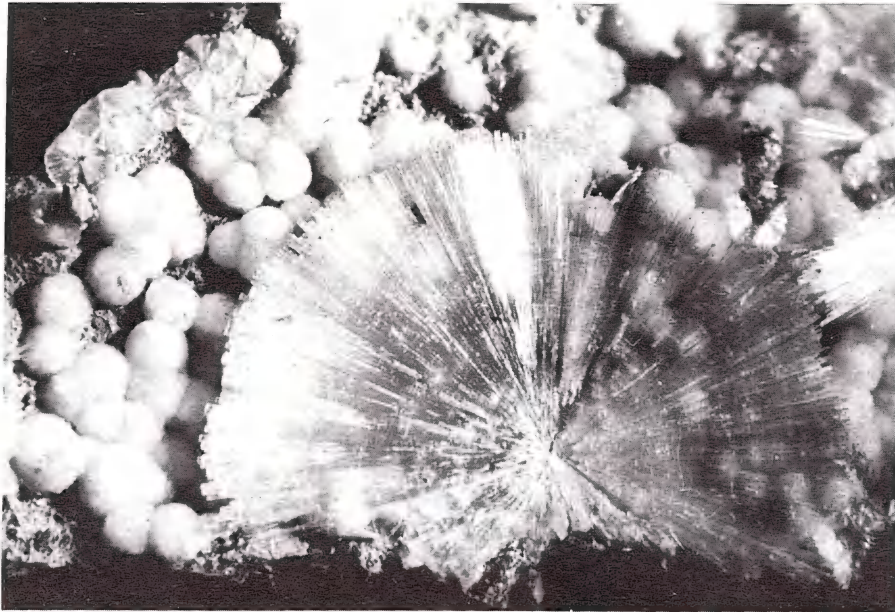
WELL EXPOSED SYNCLINE PICKED OUT BY MID-TERTIARY LIMESTONE. ISLAND HILLS, MANDAMUS VALLEY.



GOLD PANNING IN  
THE HGOBURN, NASEBY

"WHATCHER GOT THERE?"





BRUCEITE, RADIATING NEEDLES,  
HYDROMAGNESITE BALLS - NELSON.



ARAGONITE INSIDE FOSSIL  
CRAB LEG - MOTUNAU



After an excellent dinner, more showers, a good night's sleep and breakfast in bed the next morning, we were on our way back to Adelaide where the Geology Department of the University entertained us right royally at a farewell buffet dinner. The University people had been most helpful all through the tour and it was wonderful to have the opportunity to thank them for their kindness and helpfulness and to talk over our experiences with them. They also made the very thoughtful offer of crating our specimens and sending them on to us.

In fact, right from the moment we first stepped off the plane in Adelaide at the beginning of the tour, the University had done everything they could to make our tour an enjoyable and profitable one.

### Gemstones of South Australia

From information given in "The Mineral Resources of South Australia" and "Opal" - South Australian Department of Mines and Geological Survey.

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The gemstones of South Australia number at least 40, including agate, amethyst, aquamarine, beryl, cairngorm, carnelian, citrine, diamond, emerald, garnet, jasper, malachite, chert, marcasite, olivine, opal, petrified wood, cat's-eye, rose quartz, ruby, sapphire, tiger-eye, topaz, tourmaline, zircon.

But the most valuable is opal.

### Opal

Opal is hydrous silica or quartz, with variable water content up to 9%. Most of the water is absorbed or capillary and is readily lost on heating, or by exposure to a dry atmosphere. Clear varieties may become white and opaque, and large pieces may develop cracks.

There are several varieties of opal.

Common opal - without play of colour, translucency or markings to make it of value as an ornamental material. It includes milk opal, hyalite, wood opal etc.

Precious opal - exhibits a play of brilliant colours, red, orange, blue, green, usually set in translucent matrix of milky white or other body colour.

Black opal - has a black or very dark body colour.

Pin-fire opal - exhibits closely spaced specks or pinpoints of colour.

The best known deposits of opal occur in veins and cavity fillings in sedimentary and occasionally in metamorphic rocks. Deposits of this type are found in the extensive plateau areas in the interior of the continent. The principal fields at Coober Pedy and Andamooka in South Australia, and at Lightning Ridge and White Cliffs in New South Wales, are on the margins of the Great Artesian Basin in marine sediments of lower Cretaceous age.

At every deposit noted, the bedding is approximately horizontal. Kaolinitic sandstone overlies claystone at Andamooka and opal lies at or within 12 inches of the contact of these beds. In all observed deposits opal is localised at the contact between a sandy bed and an underlying impermeable claystone.

Dorothy Berrow.

#### ANOTHER CHEAP PULLEY

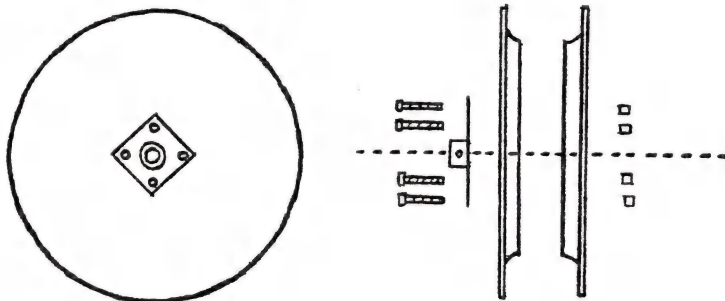
John Campbell.

The price of vee pulleys has led to my experimenting with almost anything round out of which I may make a serviceable pulley. This one is made from syrup tin lids bolted together. The components are two tin lids, cost nil, four one-inch bolts with nuts, cost 12 cents, one shafting collar, cost 18 cents, one 3-inch disc of waste metal---this could be square.

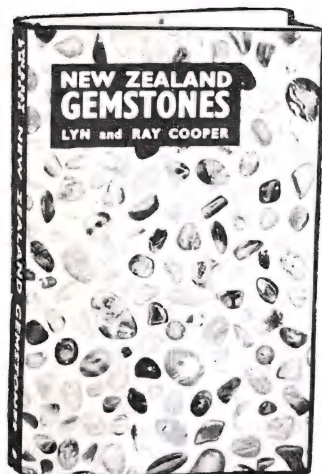
Four holes are bored in the metal disc, the shafting collar is welded in the centre of the disc, and four matching holes are bored through the two tin lids.

Care should be taken to have the tin lids evenly together and the shafting collar as near to centre as possible. The parts are lined up as shown in the diagram and bolted together. Now you have a pulley about four inches in diameter which costs about 30 - 40 cents (depending on what the welding has cost). You will be lucky to get the same sized vee pulley anywhere for under a dollar.

\* \* \* \* \*







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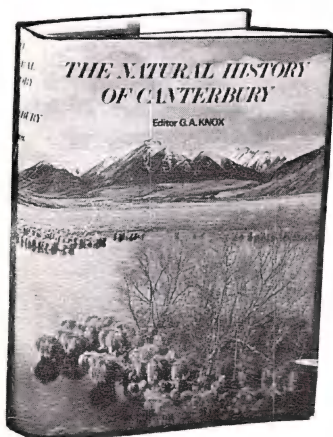
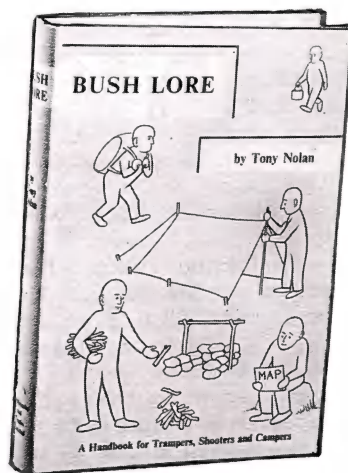
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PORT HILLS AND BIRDLINGS FLAT FIELD TRIP - 5th JULY 1969

Leader: Mr. Ken Allen.      Organiser: Mr. Neville Ross.

The day dawned bright with a nor-west wind, which soon dispersed the overnight frost for our field trip that had been postponed from the previous Saturday due to snow on the Summit Road. We left Midland Motorways at approximately 9.30 a.m. As we passed through Beckenham, Mr. Allen informed us that a well had been sunk near the Fitzgerald Avenue bridge and peat had been found 450 ft. down. Lava from the Lyttelton volcano has been discovered 750 ft. beneath the city of Christchurch. The loess-clay which covers the lower flanks of the Port Hills, below 400 ft. is not volcanic but wind deposited from the rivers and the sea-bed during the Pleistocene ice age 5,000 or more years ago. The block probably sank due to shrinkage as the volcanics cooled. The valley one can see between Cashmere and Marley's Hills was eroded rapidly over a period of 2 million years - late Miocene to early Pliocene. At this time erosion was in the order of 7 c.m. per year, due to heavy rainfall. To the left of us the road ran through pyroclastic material, i.e. broken volcanic rocks fused together. As we passed the Kiwi we had our first glimpse of the Lyttelton Caldera. The term caldera is used when the original crater has been eroded away obliterating the crater, or when the whole crater has been destroyed by eruption. Lyttelton Harbour is the eroded-out centre of the crater. The rock in this area is andesite - named after the Andes of South America - with a little basalt containing augite.

The bus stopped at the multiple dyke - the first car park to the right of the Kiwi. The multiple dyke consists of lava flows, and it is not difficult to imagine what happened. The weak spot cracked open due to volcanic activity and the lava poured through. This happened several times leaving the evidence for us to see today. Since the early erosion there hasn't been much since, according to recent potassium-argon dating. We had some beautiful views of the harbour, also of Mt. Herbert and Herbert Peak, the latter being the highest point on the Peninsular, 3,014 ft., and is a lava flow from the Akaroa volcano which fills an ancient valley. Subsidence due to shrinkage and erosion has reduced the height of the area; the Lyttelton volcano was about 5,000 ft. high. The Akaroa volcanics, 9 million years ago to 7.8 million years ago, are not as old as the Lyttelton ones, 11.9 million years ago to 9.9 million years ago, but the original volcano was higher, 6,000 ft. Quail Island is not the centre of the Lyttelton volcano - as many of us thought - but a lava cap that has resisted erosion. The Diamond Harbour Group, Halswell Quarry and Port Levy form the last eruptions on the peninsula, 8.2 to 5.8 million years ago. Basalt flows out with no eruption. The classic examples are at Hawaii where the lava flows out and one can stand on higher ground and watch without harm. The flatness of the sea-bed of Lyttelton harbour is caused by a chemical breakdown of the volcanic rock which forms feldspathic clays. The Southern Alps rose between 6 and 4 million



years ago, this was after Banks Peninsula erupted.

The Torlesse Group at Gebbies Pass are sedimentary rocks consisting of sandstone and mudstone, formed before the volcanoes erupted. These rocks are in the Torlesse Range in the porthills of the Southern Alps. I think all the members could see the marked difference between the volcanic and sedimentary rocks here. We collected specimens of flow-banded rhyolite, and later pitchstone - very similar to obsidian but containing water, making the rock very brittle. The andesite in this area is Oligocene, 32 million years ago.

On the way down to the main road we were able to collect fossil plants. These were the remains of an ancient forest destroyed by volcanic materials. The leaves and pieces of wood - carbonised - were very clear in some specimens. The McQueens andesite erupted 35 million years ago making this the earliest volcanic activity in the area.

Our arrival at Birdlings Flat was greeted by delicious hot soup; made by Dot Ross who has everyone's heartiest thanks, followed by barbecued sausages done to a turn by Neville Ross and Bob Tyree who worked hard on our field trip.

I know one club member who now possesses the most beautiful sardonyx specimen that was ever found on the beach, also a new member found a handful of petrified wood. We left the beach at about 4 p.m. after a most informative and enjoyable day.

Nora Fahey.

#### PETRIFIED WOOD

Wood locked in stone, stone flowing into grain  
Deep-rippled and combed like waving hair, this chunk,  
This chip, was broadleaf surely. Wrenched from trunk  
Wind-felled or earthquake-riven it has lain  
Passive beneath the ineluctable rain  
Of time, till all its qualities save one have drunk  
Mutation. Form endures; cold fibres sunk  
In stone an integral broadleaf character retain.

Though sap was quenched, pulse quelled an aeon ago,  
That drove this heaving rhythm through the tree,  
Its buoyant, lithe, wood-shapen pattern stands  
As wrought. Touching the stonefast silent waves I know  
I hold a fragment of eternity  
Within the crumbling substance of my hands.

Katherine O'Brien

PORT KEMBLA STEELWORKS

Doreen Tyree

During a visit to Australia in May of last year, I had the opportunity of going over the Australian Iron & Steel Pty. plant at Port Kembla, New South Wales. Typically female, I hadn't the faintest idea how iron and steel was produced, but after that long day at the works I was a clued up gal, I can tell you!

Port Kembla is on the outskirts of the city of Wollongong, which is 40-odd miles south of Sydney. A thriving city of 153,000 persons, it is situated on a narrow, fertile coastal plain, backed by towering sandstone cliffs rising to over 1,500 feet. Views from various look-outs on these crags are breathtakingly beautiful.

To visit the steelworks you must first ring to make an appointment, and this having been done we duly arrived one sunny Monday morning at 9.45 a.m., and drove to the Visitors' Centre. This was a neat, modern block of buildings through which thousands of people pass yearly. I was amazed at the facilities there just for the use of visitors. We were ushered into a very large cafeteria - "we" being about 150 sightseers booked in for this day, where we were issued with paper hats (all very hygienic) and then yellow plastic helmets, these being compulsory to wear during the tour of the plant. There was much mirth as we caught sight of each other in these not-too-flattering "chapeaux". Next we were allotted tables and our orders were taken for lunch! One of the team of guides gave us a short talk on what we would see during the day, and we were encouraged to walk around the displays along the walls; ore samples, posters, photos, finished products, etc., all laid out in an interesting and informative manner. At 10.30 we were ready to go, and outside the Centre buses were lined up waiting to ferry us around. We were a mixed lot - there were about 50 Senior Citizens down for the day from Sydney, a party of 50 or so high school girls from Melbourne, and the rest of us were just casuals. We were given a guide each per bus load - ours was a friendly Lancashire-ite, and off we went.

The buses were really necessary as the works spread over a land area of approximately 2,000 acres. We were taken to the wharf first where we were shown the loading facilities, and watched a massive ore-ship arrive from Western Australia, then back towards the coke ovens. There are 240 ovens at the plant and each one is charged with approximately  $16\frac{1}{2}$  tons of coal, and from this is produced about  $11\frac{1}{2}$  tons of high quality metallurgical coke for fuel for the blast furnaces. We were lucky enough to be right there when one of these ovens was "pushed" - a spectacular sight as the fiery contents cascaded into a waiting "hot car". On contact with the air the coke immediately burst into flames and the car was swiftly shunted a few hundred yards to a quenching tower where hundreds of tons of water was dumped on the load



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sending an enormous plume of steam into the air. If this quenching is not done speedily, our guide told us, the contents of the hot car would be reduced to a small heap of ashes in no time flat.

Away again, this time to the mighty No.4 blast furnace. I do not want to weigh you down with tedious facts and figures, but a brief quote from the pamphlet handed out at the Centre will not go amiss. "Making iron; take  $1.3\frac{3}{5}$  tons of iron ore, add  $\frac{1}{2}$  ton of limestone, and  $\frac{4}{5}$  ton of coke, add  $3\frac{3}{4}$  tons of air -- melt this in a blast furnace heated to  $3,000^{\circ}$  Fahrenheit, and you have one ton of iron,  $5\frac{1}{2}$  tons of gas, and  $\frac{2}{5}$  of a ton of slag." No.4 was truly an experience. The building towered above us, with skip cars containing iron-ore, coke and limestone endlessly riding up to the top of the blast furnace to keep it constantly charged. We followed our guide up an outside stairway of the building, passing the huge cylindrical "stoves" where air is preheated and blasted into the furnace, and then inside into the very presence of No.4 itself. We were on a sort of balcony looking down on the men working below. We were again very lucky in that we arrived just as the furnace was about to be "cast". The men drilled a hole at the base of the furnace and the fiery stream of molten metal poured out, lighting up the huge area with a scorching hellish glow. The heat and the noise defies description - I cannot adequately tell you what a terrific sight this was. Nimbly, amid showers of sparks, the men guided the stream along sand channels until it poured into huge torpedo-shaped ladles standing beneath the cast house floor. As each ladle was filled a stopper was lifted which then diverted the iron into the next ladle. The daily capacity of this furnace is 2,600 tons, and the hearth diameter is 29ft.9ins. Incidentally, it is also one of the very few in the world where the general public is actually permitted inside a blast furnace building to watch proceedings.

Every now and then I had to consciously haul up my jaw which kept falling slack with amazement at the scene below. The thought crossed my mind that if I stood there long enough I would surely melt and drip down into their iron. Then, I reflected gloomily, that would foul up their recipe and I would have to be skimmed off with the slag. The guide couldn't be heard unless he laid his lip right alongside your ear, so after he did this to all those who shouted questions, we were shepherded outside again, and down the stairway, numbed and dazed, back into the buses and back to the Centre for lunch. At our tables the food we had ordered in the morning was there waiting, all wrapped and with our names on. We paid for this, but tea, milk and sugar was free, and did it taste like nectar - steelmaking is a thirsty business. When everyone was rested and refreshed we were shown a 16mm. coloured film on the whole process of iron and steel making at this plant, half of which we had just witnessed, the other half before us.

Back to the buses and this time to the flat products division. Here we met up with our iron again, and by now it was in the shape of rectangular ingots weighing up to 11 tons. These ingots have been in furnaces called "soaking pits" where they have been literally soaked



in a heat of 2,400°F. for a period ranging from 2 to 8 hours, bringing the mass of steel in the ingot to a uniform temperature suitable for rolling. We arrived on the scene as huge cranes were lifting these glowing ingots out of the pits, passing right by us, to the primary mill, where the massive rollers of this mill rotate, kneading, strengthening and shaping the steel. Each time the ingot passes back and forth it is lengthened and shaped. We were standing on a high platform looking down on the mill which was remotely operated by a man high up in an insulated (it had to be) cabin. We were protected from flying sparks and chips of steel by thick glass, but the heat was staggering, especially when the ingots passed near, and even the platform floor seemed to burn at our feet. After that we followed our ingots as they were rolled thinner and thinner, and did a tremendous amount of walking - one building was  $\frac{3}{4}$  mile long. I wondered how our Senior Citizens were faring. I also marvelled at the colony of cats in this division, trotting about unconcernedly in the midst of all this crescendo of heat and noise - surely there wasn't a mouse problem?

By the time our steps started to flag our ingot had progressed from a strip 120 feet long, an inch thick, travelling at  $\frac{1}{2}$  a mile an hour, to one 1,800 feet long, roaring along, still glowing, at 25 miles per hour. There are many more things I could tell you about - the electrolytic tinning line, tin-plate making, the coiling of the steel strip, glimpses of the open-hearth furnaces (we were not permitted in this area), tipping blast furnace slag, etc. etc., but space does not allow, nor do I have the technical knowledge to adequately describe it all. At 3.30 p.m. the long tour ended, and we wearily climbed into the buses for the final return to the Centre. As cameras were not permitted at the plant, a set of 24 coloured slides was on sale at a very reasonable price, a percentage of which was given to many charities in Wollongong. There was very brisk business done at this counter. We handed back our helmets and the guide, on learning that I was interested in minerals, gave me a sample of the three main constituents in iron and steel making. the lump of iron-ore being, he said proudly, 64% pure. It was certainly very heavy. We cajoled him into coming outside and having his photo taken with us in the pale Autumn sunshine; he had been a super guide.

To anyone visiting Sydney, I can recommend this tour as being a must, not just for the men, but I'm sure it would interest most ladies too. It's a strenuous day, but well worth the effort. Note: Ladies, wear slacks - they are more suitable than a dress.

\* \* \* \* \*

ROCK-HOUND SAGA

The great concretions I behold with awe  
The limestone scarps -- once part of ocean's floor  
Conglomerates, once beds of ancient seas  
The fossil beds of plants and ancient trees.

Or in the stream upon the mountain side  
Where waters dance, and gem-stones neatly hide,  
Or flakes of gold await the gleaner's pan  
Where once the tail-race was the lot of man.

Ah humble stone! What treasure in your store  
Time's chariot bears your crystals to my door  
Banded agate, woods in petrous form  
Rose-quartz, tourmaline, exhumed by the storm.

To Pluto's fragments let me find my way  
His granite rocks, his agates in the bay,  
His trachytes, and his andesitic core  
His schists, his dikes, and jaspers on the shore.

Allister Evans.

\* \* \* \* \*

CONTINENTAL DRIFT

(continued from our last issue)

by K.A. Allen.

In our last magazine I summarised very briefly an article on sea-floor spreading which appeared in the Science Journal for February 1969. I recommend the original to those interested. At the end of my summary I suggested that the results of the recent work done might have implications for geology in New Zealand and promised to look at some possibilities in this issue. Perhaps it is desirable as a preliminary to remind you of a few points.

First, remember that we now have fairly clear evidence that the sea-floor is moving outward from the mid-ocean ridges, carrying, as on a conveyor belt, the land-masses resting upon it. Perhaps "sea-floor" is not a very good term in the circumstances but if you imagine the sea-floor as a thick and comparatively rigid sheet of basic rock supported by the more fluid or plastic mantle, extending all over the globe and supporting not only the sea-water but also the generally lighter rocks of the dry-land areas, then the term will suffice for our present purposes. Whew! What a sentence! Still the term will now suffice so we'll use it.

A little reflection brings to mind important corollaries to this idea of sea-floor spreading. So far as we know, the world cannot in-



crease its volume from the inside and therefore the continual up-thrusting of basalt at the ocean ridges, although it is adding to the sea-floor in these areas, cannot make the world-wide sheet of basic rock any greater in area. Therefore as fast as the sheet is being added to in one area it must be subtracted from in another. There is some evidence that this is in fact happening at the ocean trenches where one part of the sheet is being forced under another back into the mantle. I use the term "ocean trench" in this respect despite the fact that it may actually be happening beneath a land-mass because the presence of land over such a place is merely fortuitous.

Furthermore, when we remember that this happens on the surface of a sphere with an apparently hap-hazard distribution of continental areas and mid-ocean ridges, we see that movements at the surface must be very complex indeed. Large contiguous areas must tend to move in different directions and even at right angles to one another. For instance, what happens when an ocean ridge veers through a right angle? Look at the following very theoretical diagram.

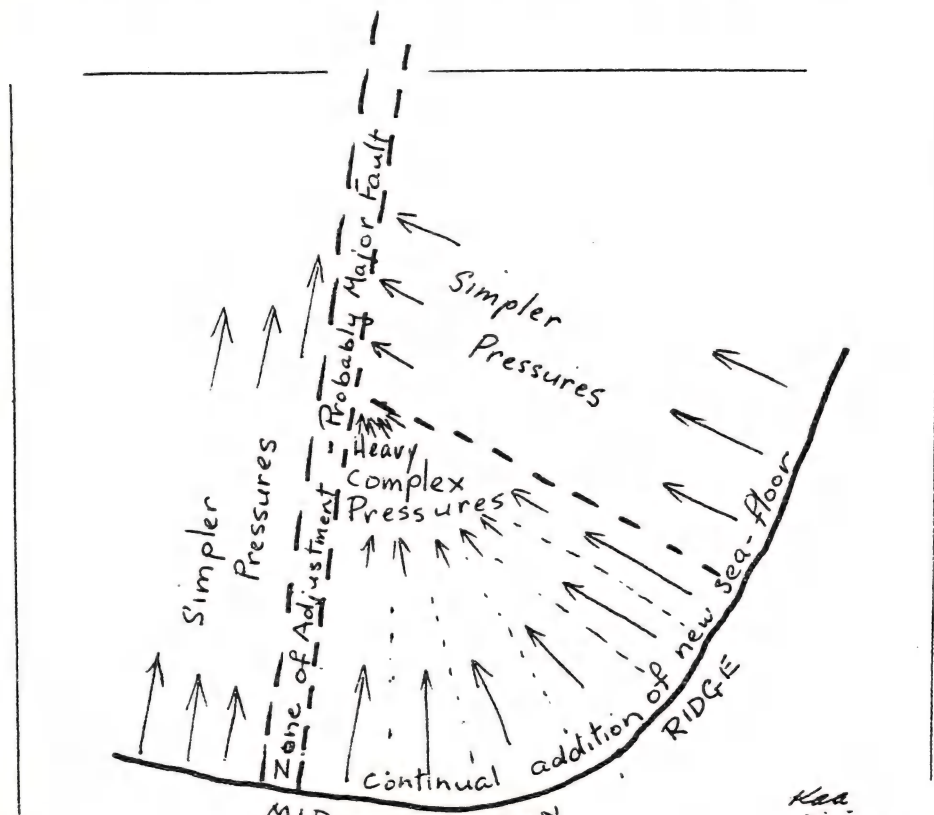


Diagram of Pressure Effects Broadly Possible  
Due to Bending of Mid-Ocean Ridge.

From this it can be seen that changes in the direction of sea-floor growth caused by the bend in the ridge must set up very great and very complex stresses within the concavity of the bend and as the ridge straightens out again stresses would be likely to be simpler in terms of any tendency to movement. Between these two areas some sort of zone of adjustment would appear to be necessary.

In fact, the South Pacific mid-ocean ridge pattern does curve something like this running more or less parallel to the N.Z. mountain spine well out to the east and then veering to the west in the Southern Ocean to pass below Australia into the Indian Ocean. This we know. What we don't know are the effects so I shall put the rest of what I have to say in the form of questions.

1. Are the Otago schists the result of the heavy and complex stresses caused by the veering of the ocean ridge despite its great distance away? Is a similar state of affairs found anywhere else in the world?
2. Is the Alpine Fault along with the several major faults obviously associated with it, the major mechanism of adjustment firstly between an area of simple stress and one of complex stress and secondly between two areas of sea-floor rocks which are moving at right angles to one another.
3. Is what we have thought of as a geosyncline not, in fact, this exactly but a movement downwards of one area of rock as the sea-floor of that area slides back into the mantle under another area of sea-floor moving at right-angles to it?
4. Are the grey sandstones etc. of the New Zealand mountain spine the scrapings of accumulated continental material which because of its lesser specific gravity has not accompanied the heavier sea-floor, on which it has rested, back into the mantle?
5. What support, if any, does the trending of fault-lines in Otago-Southland, as compared with the trending further north, give to all this?
6. Can any significant comparisons be made which would indicate a connection between the New Zealand Alpine Fault and the Tonga French?

These and many other questions, not only in New Zealand but overseas also may be asked on the basis of this new work on sea-floor spreading and only time and a tremendous amount of research will give us answers.

Perhaps, in view of the fact that sea-floor spreading appears to be going on now as in the past, the most pertinent question we should ask in this country is whether or not our dividing of it into zones of varying risk so far as earthquakes are concerned has any real



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validity. Tectonic movement on the scale this may suggest for New Zealand surely indicates a need for maximum precaution in all areas.

\* \* \* \* \*

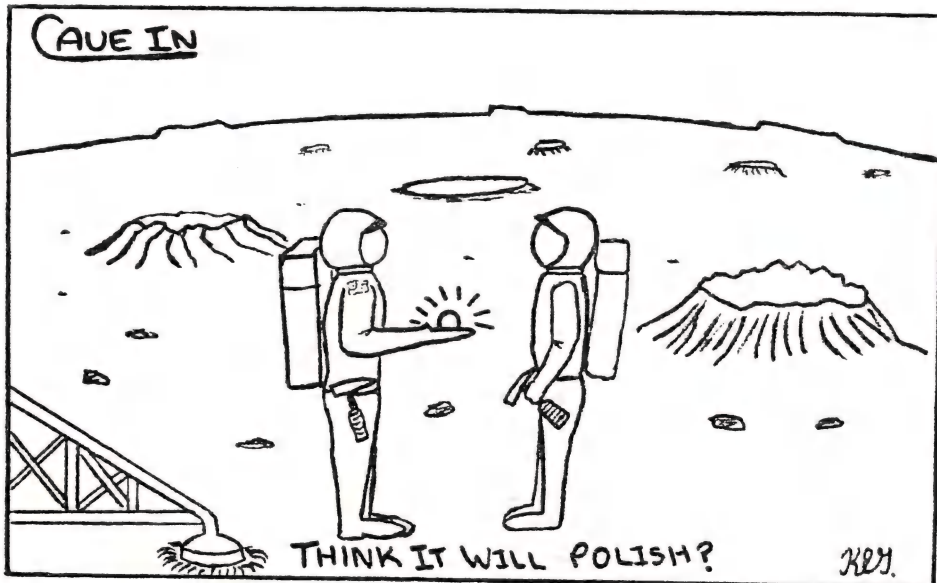
### ROCK-PUP'S REMORSE

Now Tom he was a rock-pup -- game as any demon  
He buys a pick, a chisel hard,  
A lens, a bag, a first-aid-card  
And thinks he is in heaven.

He comes across a lump of rock  
He thinks a mighty agate.  
He pulls and digs and strains and b's,  
And carries it with creaking knees  
And lugs it home in panic.

He goes to bed and dreams all night  
Of lace and moss and agate-ite.  
Alas! Alack! gets up next day  
Swears and curses every way  
His hands he rings in wild despair  
His pride is hurt -- he tugs his hair  
His agate truly was a dud ----  
'Twas just a hunk of frozen mud!!!

Allister Evans.





PSALM OF A ROCKHOUND

Considereth ye for a moment the Rockhound. Yea, he goeth forth and seeketh rocks and shineth them exceedingly. He diggeth in devious places in search of great treasure; he seeketh afar, hither and yon, all the earth being his happy hunting ground.

Queer hunks intrigueth him greatly - crystals, nodules, agates, minerals and petrifications which he saweth, sandeth, polisheth and buffeth. Yea, he sandeth away even the last imperfection and thereby he developeth patience beyond that of Job or any of his descendants.

And it came to pass that he draggeth home great quantities of material, most of which he storeth in the cellar until they runneth over into the back-yard. His enthusiasm becometh so great that his wife selleth the piano and thereby provideth space for his treasures and petrol for the car.

His pet pieces he placeth in his pocket and sallyeth forth to Club meetings and showeth them to other strange acting persons who perhaps "beateth him to the draw". The other's junk getteth a passing glance, but he gloryeth in his own. He slicketh them with saliva, and delicately exposeth them to the brightest light. He looketh through a glass at his treasures, into another wonderful world. Yea, his cup runneth over.

From his friends he buyeth, beggeth, swappeth and bartereth their treasures. He infecteth those who hearkeneth to him with a new virus which none of the wise men ever isolated, but which addeth years to his life.

His habitation he cluttereth with saws, wheels, sanders, tumblers, buffers, polishers, dops and home-made gadgets of weird and wonderful combinations. He smeareth his countenance with oil, his grits runneth over. His neighbours sleepeth restlessly while he toileth patiently far into the night.

He findeth sermons in stone, gems in running brooks and good in everything. He gloryeth in the knowledge that the Lord in his wisdom hath made them all. Surely many happy hunting-grounds will be available to him through the years of our Lord, and thereafter to his end here, and in the beyond.

from "Southwest Twin Topics" and "Gemstone", Canada.

\* \* \* \* \*

BULLER GORGE URANIUM

John Campbell

During my holidays in July I spent two days at Inangahua Junction which is still showing the scars of its 1968 earthquake. On the Monday we went through to Westport and as always when I'm there, I called on Phil Wood to see what was new in the West Coast mineral line.

Phil had a box of uranium specimens from the latest prospect shafts in the Hawks Crag area of the Lower Buller Gorge. After consulting the maps which line his office, I had a rough idea of where the track up to the mine should be and kept a sharp look out for it on the way back to Inangahua.

I had arranged to meet Phil in that area about 6 p.m. that evening and we would attempt the climb by torchlight and view the area in and around the shafts with my ultra violet lamp. However, by a stroke of luck I spotted the track up the hill so decided to have a look in daylight.

The locals estimate this to be a 1,500 ft. climb up to the mine; most of it is extremely steep and some of it is perpendicular and one must climb from tree root to tree root. I was beginning to think I wouldn't make it, then I saw evidence of habitation - some sawn timber lying in the bush, and after another 100 yards I could see the helicopter landing pad. As time was running short I only went into the first shaft and picked up a load of specimens using the ultra violet lamp under which the secondary mineral, autunite, fluoresces. Even with the daylight shining in the approximately 100 ft. long shaft, it was still quite spectacular to see the autunite fluorescing all over the walls and floor, and two or three places in the shaft were quite rich in uranium.

Well, I staggered off down to the road with a pack load of rock and discussed the danger of a night trip with my patiently waiting wife. I felt it was a bit risky so I drove through to Berlins where I tried to ring Westport and cancel our appointment for 6 p.m. I think the Reefton telephone exchange was closed for tea and after 20 minutes I gave up trying and went back through the Gorge where I later met Phil and two young chaps who were all keyed up to go and see the mine under ultra violet light. Although I was feeling the strain of the first climb up I thought I would make it again, so after sending my wife off back to Inangahua (she had by this time spent about 3½ hours "viewing" the Buller Gorge) we set off.

Surprisingly, it was quite good going by torchlight, perhaps one is more careful at night - and we made the climb in fairly good time. In the complete darkness the mine shafts looked a picture under the



ultra violet lamp and with its help we each gathered a load of good fluorescent specimens. Viewed in daylight the autunite is like bright green flakes of mica studding the matrix, which is Hawks Crag breccia.

The uranium in this area was discovered in late 1955 by Messrs. Jacobsen and Cassin, and the almost annual prospecting in the area has revealed quite extensive ore bearing areas. The concern of my wife and friends in regards to the danger of having uranium bearing minerals about the home led to my taking a specimen into the National Radiation Laboratory for testing. The Lab. personnel were most helpful and I accompanied the gentleman who did the tests on my 2x2 inch specimen. During the tests for various types of radiation the level was only twice that of the general surrounding radiation to which we are all naturally exposed at all times. I was informed that a piece 1,000 times more radio-active would not be harmful. During the course of the testing, the various types of radiation were discussed and it appears that the only danger which may arise with our N.Z. uranium is from eating or breathing in a considerable quantity of dust or ore, or alternatively breathing in a radio-active type of gas which is given off during decomposition. This latter danger is only likely to arise if one is in a confined area with a large quantity of ore.

In summing up, it would appear that this is one rock the rock-hound shouldn't lick, and as long as you open your door once a day a specimen or two inside the house is quite safe.

\* \* \* \* \*

My back is tired,  
My hands are sore,  
I'm digging slower than before.  
At first I'm kneeling,  
Then I sit,  
I begin to think it's time to quit.

From up the hill there  
comes a cry --  
A new-found rock is held up high.  
Whose back is tired?  
Whose hands are sore?  
I'm digging faster than before!

Ernie Hopfinger. U.S.A.

\* \* \* \* \*

Ground hog;--The fellow in the middle of the best diggings.  
V.I.P.;-----Someone who knows good rock hunting locations.  
Bonanza;-----Dandy gem field that hasn't been found yet.

\*  
\* Photos contributed by:  
\*  
\*  
\* Mr. D. Jones, Geology Dept.,  
\* University of Canterbury.  
\*  
\* Mrs. Anne Niethé.  
\*  
\* Mr. John Campbell.  
\*\*\*\*\*

"A diamond is a lump of coal  
that stuck to its job when the  
pressure was on."  
"LickLap" U.S.A.

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59 Papanui Rd.	Timaru.	Davidson Miss G.
Baylis Mrs O.	Campbell Mr J.	12 Liverton Cres.
71 Barton St.	12 Norris St,	Davies Mrs E.C.
Beardsley Mr & Mrs W.G.	Prebbleton.	Arrowhena,
294 Clyde Rd.	Carlile Mr & Mrs W.	Greenpark, 2 R.D.
Beaton Mr R.L.	41 Beckford Rd.	Deans Mr R.H.
25 Coronation St.		Lincoln College.

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Dennis Mr C.W.	Frecka Mr & Mrs F.	Harrold Mrs N.
Hororata, R.D.	511 Barbadoes St.	845 Main Nth Rd.
Dennis Mr R.P.	Freeman Mr E.	Hedges Mrs A.
Down's Rd, Hororata.	52 Mays Rd.	22 College Rd.
Diver Mr J.A.	French Mr & Mrs H.N.	Henwood Miss R.
222 Knowles St.	10 Cossar St.	9 Coulter St.
Dixon Mrs R.	Frengley Mr G.	Hepworth Mr J.R.
22 Bampton St.	46 Balrudy St.	230 Waimairi Rd.
Dow Mr K.A.D.	Furjan Mr J.	Heta Mrs D.M.
13 Richards Rd.	45 Pages Rd.	Pte Bag, Pakawau,
Dowie Mr F.	Gage Prof. Maxwell,	Collingwood.
Box 823 Chch.	Canty University.	Hill Mr C.R.
Duncan Mr E.J.	Gallavin Mr B.	44 Mortlake St.
117 Queen St,	52 Moreland Ave.	Hogan Mrs W.
Westport.	Gillies Mr S.	165 Moncks Spur Rd.
Duns Mrs P.W.	17a Forth St,	Holyoake Mr & Mrs D.C.
4 Plynlimon Rd.	Oamaru.	63 Francis Ave.
Eddy Mr D.C.	Gillies Mrs S.	Hood Mr & Mrs A.J.
74 Marlborough St,	17a Forth St,	13 College Rd.
Greymouth.	Oamaru.	Lyttelton.
Edwards Mr M.B.G.	Graham Mr A.L.	Hope Mr G.
7 Philpotts Rd.	35 Westburn Tce.	R.D.I. Gisborne
Elwood Mr E.F.	Granger Mr M.	Horridge Mr R.A.
68 Smith St,	17 Maltby St,	27 Longmuir St.
Emmett Mr A.	Timaru.	Howden Mr D.E.
8 Thorrrington Rd.	Greatrex Mrs W.J.	8 R.D. Ashburton.
Evans Mrs M.G.	66 Dyers Pass Rd.	Hughes Mrs J.
60 Murray Place.	Gregg Mr D.R.	Speechleys Bridge,
Evans Mr R.A.	Canty Museum.	I.R.D. Geraldine.
216 Dyers Pass Rd.	Grieg Mr D.H.	Hyde Mr J.R.
Fahey Mrs C.N.	Mill Lane, Brookside,	271 Innes Rd.
192 Peterborough St.	R.D. Leeston.	Hyde Mr M.C.
Fantham Mr S.	Guard Mr & Mrs S.	Gore Bay, Cheviot.
25 Aorangi Rd.	45 Mt Cook Rd,	Inch Mr D.H.
Fergusson Mrs J.E.	Fairlie.	34 Anglesey St,
17 Bethel Cres.	Hagood Mr D.C.	Invercargill.
Fernandez Mr & Mrs C.F.	7 Thorrrington Rd.	Inch Mr & Mrs G.
Wade River Rd, R.D.I,	Hales Mr S.	'Glen Arlie' Whitecliffs,
North Auckland.	35 Canberra Place.	Hororata.
Finnegan Mr J.M.	Hallmond Mrs J.H.	Jarrett Mrs M.
285 Gt South Rd,	34 Liston Cres.,	Pte Bag, Pakawau,
Greenlane, Auckland.	Hillcrest, Hamilton.	Collingwood.
Fleming Mr R.J.	Hamilton Mr J.	Johnson Mrs M.D.
3 Nayland St.	12 Bushby Place.	75 Major Hornbrook Rd.
Foote Mr R.	Hansen Mr W.	Johnson Miss S.
185 England St.	45 Northcote Rd.	Fairton, 2 R.D.,
Forster Mrs R.C.	Hanson Mr L.D.	Ashburton.
23 Carrie St, Zillmere,	Box 201 Gore.	Johnston Mrs J.M.G.
Brisbane 4034, Aust.	Hansmann Mr & Mrs J.C.	78 Bristol St.
Foster Mr & Mrs A.T.	14 Shearer Ave.	Justice Mr C.R.
240 Avonside Drive.	Harris Mrs F.	44 Bourne Cres.
	445 Innes Rd.	Kelleher Mr & Mrs R.
		24 Weston Rd.

LIST OF FINANCIAL MEMBERS-JULY 31 st 1969

Kennett Mr & Mrs R.C.	Milne Mr B.J.	Owles Mrs P.
37 Thackery Place.	24 Kinnaird Place.	24 Gibson St.
Klinkum Mr M.E.	Mitchell Mr & Mrs J.A.	Palmer Mrs N.H.
447 Greers Rd.	44 Penrith Ave.	45a Roberta Drive.
Laraman Mr K.	Monaghan Mr T.P.	Paltridge Mr G.
6 Te Anau St,	560 Harewood Rd.	131 Warrington St.
Otematata.	Moore Mr J.B.	Pascoe Mr T.
Lees Mr & Mrs A.	2 Ethne St.	R.D. Darfield.
22 Boston Ave.	Morgan Mr D.B.	Paterson Mrs A.W.
Lees Mr F.W.	55 Ottawa Rd.	5 Albany St,Gore.
10 Clutha St,	Morgan Mr R.F.	Paterson Miss S.
Alexandra.	55 Ottawa Rd.	22a Stoneyhurst St.
Lees Mr R.M.	Morrin Mr E.	Penny Mrs R.C.
79 Pages Rd.	45 Wychbury St.	3 Colac St.
Leith Mr A.	Mullins Mrs D.	Perham Mr L.
Lincoln College.	317 Keyes Rd.	9 Longmuir St.
Lillico Mr R.B.	Murdoch Mrs J.J.	Perkin Mrs E.K.
Sorrento Lounge,	245 Papanui Rd.	109a Garlands Rd.
Timaru.	Murdoch Mrs T.	Perkins Mr C.T.
Lovegrove Mr G.B.	Netherwood,	Fairton, No 2 R.D.
3 Trafalgar St,	3 R.D. Amberley.	Ashburton.
Timaru.	McCallum Mr M.W.	Pickard Mrs K.
Lowen Mr & Mrs A.W.	435 Avonhead Rd.	Haast School,
Alma Motels,	McCarten Miss J.	Sth Westland.
18 C.R.D. Oamaru.	89 Staveley St.	Pierre Mrs M.P.
Lucas Mr & Mrs W.F.	McConnell Miss C.E.	5 Dunbars Rd.
6 Garvins Rd.	3 Bradford Ave.	Poff Miss M.
Mahan Mr A.T.	McDowell Miss J.	18 Gordon Ave.
238 Greers Rd.	30 Logan St,	Poynton Mr T.
Mannerling Mr G.K.	Belfast.	16 Birch St.
176 Waltham Rd.	McIntosh Mr F.H.	Price Mr G.
Manning Mr & Mrs G.	53 Walnut Ave.,	95 Condell Ave
49 Te Kawa Rd,	Ashburton.	Proffitt Mr J.R.
One Tree Hill, Auck.	McKenzie Mr & Mrs T.	254 Breezes Rd.
Manning Sir Geo. & Lady,	32 Uranga Ave.	Raymond Mr D.S.
7 Bletsoe Ave.	McNabb Mr L.	5 Douglas St,
Mansfield Mr G.E.	32 Rollesby St.	Rotorua.
227 Avonhead Rd.	Newton Mr M.	Reece Mrs F.
Marsden Mr & Mrs W.	Brockley, Glenroy.	56 New Brighton Rd.
64 Proctor St.	Nichols Mr & Mrs A.C.	Reeve Mrs M.P.
Mather Mr R.	Kuriheka, Maheno.	28 Smith St.
27 Wyn St.	R.D. Oamaru.	Reid Miss R.M.
Matla Mrs J.	Niethe Mrs A.	72 Thames St.
184 Bridlepath Rd.	31 Bellamy Ave.	Richardson Mr & Mrs F.W.
Miles Mr C.L.	Ochtman Mr A.	125 Selwyn St.
Canty University.	230 Geraldine St,	Rickson Mr L.N.
Miller Mr I.N.	O'Connor Mr R.E.	21 Tirangi St.
27a Jacksons Rd.	55 Baynes St.	Robb Mr C.M.
Mills Mrs Z.G.	Okey Mr J.N.	16 Mt Pleasant Rd.
17 Robson Ave.	146 Dyers Pass Rd.	Roberts Mrs M.
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Oamaru, Five Forks.	Osborne Miss E.	127 Ashgrove Tce.
	185 Cranford St.	



LIST OF FINANCIAL MEMBERS - JULY 31 st 1969

Robinson Mr L.H. 130 Richardson Tce.	Spence Mr & Mrs P. 54 Sabina St.	Tregoning Mr L.E. 21 Domain Tce.
Rosanowski Mr H.A. 16 Butler St.	Spragg Mr C. R. 34a Leyden St.	Tubb Mr R.G. 99 Mays Rd.
Rose Mrs A.G. 12a Butler St.	Spencer Mr & Mrs J.B. 44 Cleveland St.	Turnbull Mr H. 29 Hillview Rd.
Ross Mr & Mrs N. 53 Ottawa Rd.	Sprott Mrs J.W. 34 Mundys Rd.	Little River.
Rowe Mr & Mrs A.C. Staff P.B. 12.123 Christchurch.	Stephens Mrs T. P.O.Pironga, Te Awamutu.	Tyree Mr & Mrs R.W. 11 Longmuir St.
Ruddle Miss M.G. 24 Roosevelt Ave.	Steven Mrs A.M. 94 Beverley Rd, Timaru.	Underhill Miss W.V. 71 Hastings St.
Sampson Mr & Mrs S.J. 3 Elizabeth St.	Stewart Mrs M. 14 Snell Place.	Van Brucken Miss A.C. 176 Moncks Spur Rd.
Sandeman Mrs B.J. 'Ardmay'Governors Bay, Lyttelton.	Stott Mrs H.N. Box 167 Oamaru.	Van Houten Mrs H. 110 Birdwood Ave.
Savage Mr P.A. 40 Bellvue Tce.	Stott Mrs W.P. Charing Cross, No 1 R.D. Chch.	Vlier Mr C.J. 160 Riccarton Rd.
Sawyers Mr W.H.B. 62 Corson Ave.	Stow Mr W.M. 53 Horotane Valley.	Wakeham Mr & Mrs W.G. 64 Sparks Rd.
Schreiber Mrs M. Box 33276 Takapuna, Auckland 9.	Struthers Mr & Mrs K. 92 Tilford St.	Warren Miss M. No 1 R.D.Greendale.
Scragg Mr J.R. 146 Tancred St, Ashburton.	Styles Mr A.H. 374 Barbadoes St.	Watson Mr & Mrs N.A. 14 Kinnaird Place.
Senter Mr F. 134 Fisher Ave.	Sutherland Mr G. 120 Ilam Rd.	Webb Mr G. No 1 R.D.Rakaia.
Shackleton Mrs M.G. 14 Seddon St.	Sweetman Mrs S. Box 24 Boulia, Qnsld Australia.	Weeber Mr & Mrs. No 7 R.D.Ashburton.
Shadbolt Mrs R. Ladbrooks, No 2 R.D. Christchurch.	Syddall Mr A.V. 3 Bellvue Tce.	Wilkinson Mr & Mrs H.W. 209 Hoon Hay Rd.
Sim Mr L.C. 1 Wellington St, Timaru.	Syddall Miss J. Lincoln College.	Willes Mr W. 14 Westenra Tce.
Smillie Mr & Mrs A. 18 Naseby St.	Taylor Mr & Mrs S.G. 270 Sawyers Arms Rd.	Willetts Mrs C.V. 'Glenmorria', 5 H.R.D.Oamaru.
Smith Mr K.V.C. 6 Point Beach Rd, Waimate.	Taylor Mr R.N. Box 434 Nuku'alofa, Tonga.	Young Mrs E. 71 Retreat Rd.
Smith Mrs C. 7 Creek Rd, Ashburton.	Temoko Mr T. Box 67 Hokitika.	Willmott Mr I.E. 30 Hastings St.
Smith Miss P. 79 Ashgrove Tce.	Thomas Miss L. 157 Springfield.	Wilson Mr H.W. 55 Marston Rd, Timaru.
	Thompson Mr T.C. 355 Main St.	Wilson Mr R. 60 Grey St, Woodville.
	Palmerston Nth.	Wood Mr G.H. 122 Memorial Ave.
		Woolsey Mr E.C. 52 Wycla Ave.
		Wright Mr & Mrs M.E. 59 Sparks Rd.



THE CANTERBURY MINERAL & LAPIDARY CLUB INC

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Canterbury Mineral & Lapidary Club,  
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CHRISTCHURCH.

I wish to apply for membership as a \*.....

	<u>Annual Sub.</u>
*Family member (Husband and/or wife and dependent children)	\$4.20
*Ordinary member	\$3.00
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Remittance with application form to P.O. Box 84, please.	

NOTE: Between November 1st and March 31st the subscription is HALVED.

Name:.....Occupation:.....

Address:.....Telephone No.....

.....Date:.....

I agree to abide by the Rules of the Club

Signature:.....

Your main interest at the moment is: (Please tick)

Minerals

☐

Lapidary work

☐

Tick both  
if you  
want to.

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<u>President:</u>	Mr F.W. Richardson	Phone 326.174
<u>Vice-President:</u>	Mr A. Evans	Phone 34.348
<u>Vice-President:</u>	Mr N. Ross	Phone 898.012
<u>Editor:</u>	Mrs D.C. Tyree	Phone 585.216
<u>Secretary-Treasurer:</u>	Mrs Betty Reece	Phone 81.420

Please 'phone any of the above if you require any information concerning the Club.

BY - LAWS

1. These By-Laws include, amongst other matters, the codes of ethics and safety of the club's old Clause 1.
2. All Members are required to conform to the By-Laws and amendments thereto, and to all regulations promulgated from time to time governing the activities of the Club.
3. Permission must be obtained before entering private property and all property left as found. Stock, implements, fences or buildings must not be interfered with, and if holes are dug these must be filled in. In particular, gates must be left as found, unless specific arrangements to the contrary have been made with the owner of the property.
4. No member shall carry firearms or other offensive weapons on field outings.
5. Dogs are not permitted on Field Trips.
6. Greatest care must be taken on outings to ensure the safety of others during field activities. Boulders or landslides must not be set in motion and adequate precautions against fire taken.
7. Shafts or drives in any area that has been mined may be entered under the supervision of the leader only. The strictest safety precautions are to be observed by those participating. Suitable lighting and any other necessary equipment must be available before the shaft or drive is entered. Members entering mined or quarried areas do so at their own risk.
8. Sharp pieces of stone must not be left on roadways, tracks or any other place where injury to property, stock or persons may occur.
9. The Club will not accept any responsibility for accidents incurred by any members.
10. The Organizer shall arrange for a Club first-aid kit to be taken on all field trips.
11. All members constructing or using machinery for lapidary work should ensure the equipment is properly guarded against hazards to themselves, their families or to any other persons.
12. All members should be encouraged to wear safety glasses in the vicinity of any operation which may be hazardous to eye safety.
13. All members are required to use reasonable endeavour to promote the objects for which the Club stands.
14. Members shall conform to the Rules laid down for any trip by the Trip Leader, and may not leave the group singly. All members wishing to do so must have the approval of the Trip Leader.







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4.12.